POGORELOV, I.D., inzh.; ZEMSKOV, P.I., kand.tekhn.nauk

Cold electric-arc welding of cast iron. Izv.vys.ucheb.
zav.; mashinostr. no.2:146-152 '59.   (MIRA 13:3)

1. Khar'kovskiy institut inzhenerov kommunal'nogo stroitel'-
stva i Khar'kovskiy zavod "Serp i molot".
            (Electric welding)

ZEMSKOV, Pavel Ivanovich; YAKUSHINA, Yelena Nikolayevna;
KHARCHENKO, Yevgeniy Nikolayevich; ZUBENKO, I.F., dots.,
otv. red.; ALYAB'YEV, N.Z., red.

[Materials and coatings for the piston rings of motor-
vehicle and tractor engines] Materialy i pokrytiia porsh-
nevykh kolets avtotraktornykh dvigatelei. Khar'kov, Izd-
vo Khar'kovskogo univ., 1963. 129 p.   (MIRA 17:8)

ZEMSKOV, P.I.; YAKUSHINA, Ye.N.

Antifriction pseudoalloys for engine bearings. Avt. prom. 29
no.7:21-23 Jl '63.   (MIRA 16:8)

1. Khar'kovskiy traktornyy zavod.
                    (Bearing metals)

ZEMSKOV, P.I., kand. tekhn. nauk; YAKUSHINA, Ye.N., inzh.

Using pseudoalloys as substitutes for bronzes and babbitts.
Mashinostroenie no.3:110 My-Je '63.   (MIRA 16:7)

1. Khar'kovskiy traktornyy zavod.
                    (Powder metallurgy)

ZEMSKOV, P.I., inzh.; POGORELOV, I.D., inzh.; YAKUSHINA, Ye.N., inzh.;
KHARCHENKO, Ye.N., inzh.

Welding and soldering during the repair of AL10V aluminum
alloy parts. Svar. proizv. no.8:40-41 Ag '63.
(MIRA 17:1)

1. Khar'kovskiy zavod "Serp i molot".

ZEMSKOV, P.I., dotsent; POGORELOV, I.D.; YAKUSHINA, Ye.N.

Soldering aluminum parts. Mashinostroitel' no.7:38-39 Jl '62.

(MIRA 15:7)

(Aluminum—Welding)

ZEMSKOV, P.I., kand.tekhn.nauk, dotsent; POGORELOV, I.D., inzh.; BALYUK, B.K., inzh.

Investigating the performance of engine bimetallic bushings made with ASM alloy. Izv.vys.ucheb.zav.; mashinostr. no.11:79-83 '61.
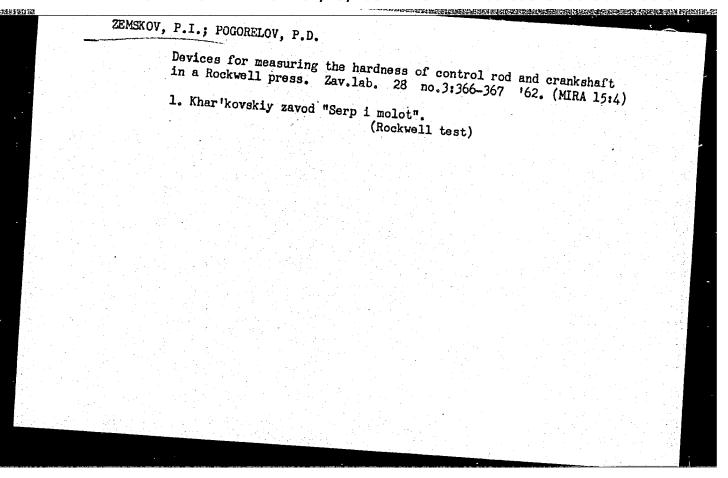
(MIRA 14:12)

1. Khar'kovskiy institut inzhenerov kommunal'nogo stroitel'stva.
(Aluminum alloys--Testing)

ZEMSKOV, P.I.; POGORELOV, I.D.

      Device for testing the hardness of shafts. Mashinostroitel'
      no.5:37 My '62.   (MIRA 15:5)
                    (Rockwell test)

ZEMSKOV, P.I.; YAKUSHIN, Ye.N.; KHARCHENKO, Yc.N.

Wearing resistance of crankshafts from high-strength cast iron.
Trakt. i sel'khozmash. no.1:41-43 Ja '64.   (MIRA 17:4)

1. Khar'kovskiy traktornyy zavod.

ZEMSKOV, P.I.; POGORELOV, P.D.

Devices for measuring the hardness of control rod and crankshaft in a Rockwell press. Zav.lab. 28 no.3:366-367 '62. (MIRA 15:4)

1. Khar'kovskiy zavod "Serp i molot".

(Rockwell test)

ZEMSKOV, P.I., kand.tekhn.nauk, dotsent; POGORELOV, I.D., inzh.

Investigating high-grade cast iron as material for piston rings of motor-vehicle engines. Izv.vys.ucheb.zav.; mashinostr. no.4: 138-147 '62.

(MIRA 15:7)

1.   Khar'kovskiy institut kommunal'nogo khozyaystva.

(Cast iron—Testing)

(Piston rings)

ZEMSKOV, P.I., dotsent, kand.tekhn.nauk; POGORELOV, I.D., insh.

Making distributing shafts of gray iron. Izv. vys. ucheb. zav.;
mashinostr. no. 10:106-114 '60.
(MIRA 14:1)

1. Khar'kovskiy kommunal'nyy institut.
(Tractors--Engines)

ZEMSKOV, P.I., kand.tekhn.nauk.dotsent; POGORELOV, I.D., insh.

Comparative data on antifriction properties of some plastics. Izv.vys.
ucheb.zav.; mashinostr. no.3:77-81 '60.
(MIRA 14:3)

1. Khar'kovskiy institut inzhenerov kommunal'nogo stroitel'stva.
(Plastics--Testing)

ZEMSKOV, P.I., dotsent, kand.tekhn.nauk; POGORELOV, I.D., inzh.

Experience in welding and soldering aluminum parts at the "Serp i
Molot" Plant in Kharkov. Izv.vys.ucheb.zav.; mashinostr. no.7:
89-95 '59.
                                                        (MIRA 13:6)

1. Khar'kovskiy institut inzhenerov kommunal'nogo stroitel'stva.
     (Electric welding)   (Solder and soldering)

ZEMSKOV, P. I.

ZEMSKOV, P. I. --"Investigation of the Wear on Piston Rings of Automobile
    Engines." Min Higher Education Ukrainian SSR. Khar'kov, 1955.
    (Dissertation for the Degree of Candidate in Technical Sciences.)

So.: Knizhnaya Litopis', No. 7, 1956.

ZEMSKOV, P.I., kand.tekhn.nauk, dotsent; POGORELOV, P.D., inzh.

Device for measuring the hardness of a crankshaft. Izv.vys.ucheb.-
zav.; mashinostr. no.7:177 '61.   (MIRA 14:9)

1. Khar'kovskiy institut inzhenerov kommunal'nogo stroitel'stva.
                    (Hardness--Measurement)

S/145/60/000/003/008/010
D221/D301

AUTHORS: Zemskov, P.I., Candidate of Technical Sciences, Docent
             and Pogorelov, I.D., Engineer

TITLE: Comparative data on antifrictional properties of
             certain plastics

PERIODICAL: Izvestiya vysshikh uchbenykh zavedeniy. Mashino-
             stroyeniye, no. 3, 1960, 77 - 81

TEXT: The Central Factory Laboratory at the "Serp i molot" plant
in Khar'kov investigated antifrictional properties of plastics.
Specimen bushes from normal caprone, and also caprone with 3-5 %
of an graphite admixture as well as tekstolite, voloknite and feno-
plast were tested. The inserts worked with a steel shaft, cт-45
(st-45), R_c - 60 and H_b - 170, and a high strength cast iron, R_c-
40, H_b - 170. Bronze, babbitt and cast iron bushes were tested for
comparison. The purpose was the study of the effect of speed, load,
lubricant, material and hardness of shaft on the coefficient of
friction. Tests were carried out on an MИ (MI) machine. The wear on

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Comparative data on antifrictional ...

S/145/60/000/003/008/010
D221/D301

bushes was measured by analytical balance. The surface of rollers which imitated the shaft was ground. Hardened and untreated rollers were employed. The lubricant was formed by Industrial'noye (Industrial) 20, AK-10 and ДП-14 (DP-14) oils and nepccolmĸoл AЩ (perssolidol ASh) grease. The minimum wear was exhibited by caprone, especially when having 3 - 5 % graphite additive, $Q = 0.5 \mu$ and $Q = 0.1 - 0.2 \mu$ respectively. The wear for other plastics was 4 - 5 times greater. This amounted to 2.5 μ for bronze and babbitt bushes and 10 μ in the case of cast iron insert. The caprone with graphite indicated best antifrictional properties, but the minimum friction torque is shown by babbitt. This torque has a marked tendency to rise at the beginning of running-in of caprone and then falls again The friction coefficient of caprone depends on load and speed, as indicated by graphs. It is highest at low loads. The wear of caprone inserts increases with the hardness of shaft. Cast iron shaft exhibits a smaller friction which is apparently due to greater porosity of former and also on account of lubricating properties of its graphite. The friction in caprone is lower when AK-10 oil is used than when lubricating with "Industrial 20". The minimum friction and wear take place during work of caprone with grease. The
Card 2/3

Comparative data on antifrictional ...   S/145/60/000/003/008/010
D221/D301

authors conclude that caprone is the most suitable for bushes. In
the case of inadequate lubrication, caprone with 3 - 5 % of graphi-
te addition is recommended. There are 5 figures.

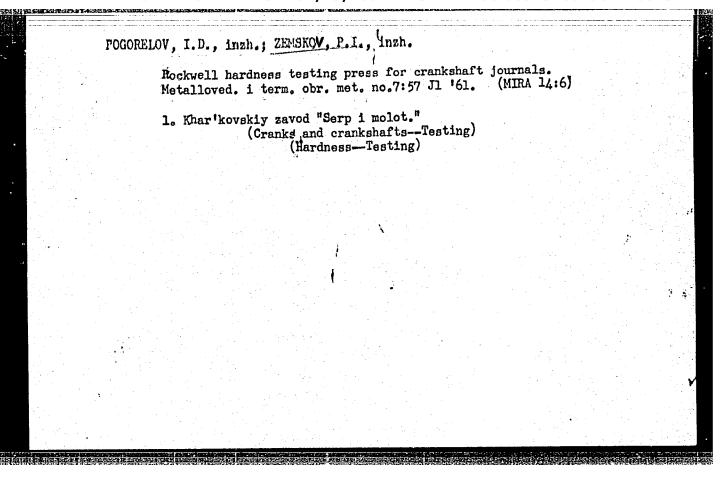ASSOCIATION: Khar'kovskiy institut inzhenerov komunal'nogo stroitel-
stva (Khar'kov Institute of Engineers of Civil Con-
struction)

SUBMITTED: July 17, 1959

Card 3/3

ZEMSKOV, P. I.; POGORELOV, I. D.

Investigating the wear of piston rings made of high-strength cast iron in motor-vehicle engines. Avt. prom. 28 no.9:30-33 S '62.   (MIRA 15:10)

1. Khar'kovskiy zavod "Serp i molot".

(Piston rings—Testing)

POGORELOV, I.D., inzh.; ZEMSKOV, P.I., inzh.

Rockwell hardness testing press for crankshaft journals.
Metalloved. i term. obr. met. no.7:57 Jl '61.   (MIRA 14:6)

1. Khar'kovskiy zavod "Serp i molot."
        (Cranks and crankshafts--Testing)
            (Hardness--Testing)

AID P - 4288

Subject   : USSR/Engineering

Card 1/1   Pub. 128 - 13/25

Authors   : Yengalychev, I. M., Engineer and P. I. Zemskov

Title   : Experience in sulphide coating at the Khar'kov plant
                "Serp i Molot".

Periodical   : Vest. mash., #2, p. 46-48, F 1956

Abstract   : The sulphide process for surface coating of cast iron
                and steel parts to reduce wear and scuffing, particularly
                between piston rings and cylinders, has been investigated
                in the Khar'kov plant. Various caustic sulphide baths at
                different temperatures of treatment are reported. Photos,
                tables, chart.

Institution : None

Submitted   : No date

ZEMSKOV, P.I., inzh.; YAKUSHINA, Ye.N., inzh.; KHARCHENKO, Ye.N., inzh.;
KHAVINA, R.B., inzh.

Engine pinions made from high-strength cast iron. Mashinostroenie
no.2:12-14 Mr-Ap '65.
(MIRA 18:6)

ZEMSKOV, P.I., kand.tekhn.nauk; KHAVINA, R.B., inzh.; DEGTYAREVA, O.F., inzh.;
YAKUSHINA, Ye.N., inzh.; KHARCHENKO, Ye.N., inzh.; ANISHCHENKO, V.V.,
inzh.

Capron pinions for motor-vehicle engines. Mashinostroenie
no.6:42-44 N-D '65.   (MIRA 18:12)

ZEMSKOV, P.I., dotsent; YAKUSHINA, Ye.N., inzh.; KHARCHENKO, Ye.N., inzh.;
KHAVINA, R.B., inzh.; DEGTYAREVA, O.F., inzh.

Cermet piston rings. Izv. vys. ucheb. zav.; mashinostr. no. 10:
123-128 '65   (MIRA 19:1)

1. Submitted April 17, 1964.

L 07438-67   EWT(m)/EWP(t)/ETI   IJP(c)   JD
ACC NR: AP6029220   (A, N)   SOURCE CODE: UR/0145/66/000/004/0059/0063

AUTHOR: Zemskov, P. I. (Docent); Yakushina, Ye. N. (Engineer); Kharchenko, Ye. N. (Engineer); Khavina, R. B. (Engineer); Degtyareva, O. F. (Engineer)

ORG: None

TITLE: Improving the durability of chrome-plated piston rings

SOURCE: IVUZ. Mashinostroyeniye, no. 4, 1966, 59-63

TOPIC TAGS: engine piston, engine cylinder, carburization, chromium plating

ABSTRACT: Methods are proposed for increasing the wear resistance of the upper piston rings in tractor engines by carburizing the chrome-plated surface. The surfaces of the rings and cylinder were knurled before chrome plating. The knurl depressions were tetrahedral pyramids with a base of 0.5×0.5 mm located 2 mm apart with a depth of 0.18-0.25 mm. After chrome plating, the rings were chemically heat treated in a solid carburizer of the following composition: carbon—50%, Na_2Co_3—20%, Fe (filings)—30%. The heat treatment was continued for 5 hours at 950°C. X-ray structural analysis showed a gray layer of chromium carbide on the metal surface. This layer was 60-80 μ thick and was not etched by a 3-4% solution of HNO_3 or a 15-20% solution of HCl. The carbide layer is heat- and acid-resistant with a hardness of 1400-1600 kg/cm^2. It was found that carburization increases the service life of chrome-plated piston rings by a factor of 1.3-2.2. The article was presented for publication by A. I. Pogorelov, Lecturer at Kharkov Municipal Engineering Institute. Orig. art. has: 3 figures. 1 table.

SUB CODE: 10, 13/ SUBM DATE: 18Jun64/ ORIG REF: 002

UDC: 62-47/-242

Card 1/1

ZEMSKOV P. M.

KAGANSKIY, M.G.; ZEMSKOV, P.M.

Sensitive instrument for conductometric analysis. Bum.prom. 29 no.10:
21-22 O '54.   (MLRA 7:11)

1. TSentral'nyy nauchno-issledovatel'skiy institut bumagi.
   (Volumetric analysis)

ZEMSKOV, P.

Consolidation of automotive transportation units and centralization
of hauling leads to technical development. Avt. transp. 37 no.2:12-15
F '59.   (MIRA 13:1)

1.Glavnyy inzhener Glavmosavtotransa.
          (Transportation, Automotive)

ZEMSKOV, S.

Fulfilling the annual plan ahead of time. Avt.transp. 32 no.6:14-16
Je '54.   (MLRA 7:9)

1. Avtokolonna No. 60 Tul'skogo oblastnogo avtotresta.
   (Transportation, Automotive)

TITLE: Double Chlorides of the Elements of the Cerium Group
With Trimethylamine Chloride (O dvoynykh khloridakh
elementov tseriyevoy gruppy s khloridom trimetilamina)

ABSTRACT: Earlier the first author investigated double chlorides
(Ref 1) and nitrites (together with G. V. Medoks, Ref 2)
of the elements of the group in question with the corresponding
tetraphenyl-phosphonium (Refs 3-5). Later Medoks (Ref 6)
isolated double nitrates of lanthanum, praseodymium, and
neodymium with triphenyl benzyl phosphonium. In continuation
of the above mentioned papers the authors included the
methylamine-dimethylamine- and trimethylamine chlorides
in their investigations. They intended to clear up the
nature of the complex formation of the chlorides of rare
earths with the corresponding salts of the amides in
question in the presence of water and in nonaqueous media
according to their degree of substitution. As an introduction
it was stated that the chlorides of the 4 metals from several

Card 1/3

Double Chlorides of the Elements of the Cerium   SOV/20-120-3-28/67
Group With Trimethylamine Chloride

compounds in the combination with trimethylamine chloride
in the presence of 96%-ethyl alcohol, the formation of
which is dependent upon the relative amounts of the
substances entering interaction, and upon the crystallization
conditions. As a result of the conducted work double
chlorides of rare earths with trimethylamine in the presence
96%-ethanol were produced. They correspond to the general
formuale $MeCl_3 \cdot 4(CH_3)_3N \cdot HCl$, where Me denotes La, Ce, Pr

and Nd. The properties of these compounds were examined,
and the solubility in water and organic solvents was determined.
There are 6 references, 6 of which are Soviet.

ASSOCIATION: Saratovskiy gosudarstvennyy universitet im. N.G. Chernyshevs-
kogo (Saratov State University imeni N. G. Chernyshevskiy)

PRESENTED: January 24, 1958, by I. I. Chernyayev, Member, Academy
of Sciences, USSR

SUBMITTED: September 10, 1956
Card 2/3

Double Chlorides of the Elements of the Cerium   SOV/20-120-3-28/67
Group With Trimethylamine Chloride

1. Rare earth chlorides--Chemical reactions   2. Amine chlorides--Chemical
reactions   3. Ethanol--Applications   4. Complex compounds--Properties
5. Organic solvents--Performance

Card 3/3

S/137/62/000/001/033/237
A060/A101

AUTHORS: Koz'min, Yu. A., Zemskov, S. V., Ryabinin, A. I.

TITLE: Application of the sulfide-sulfite method in the processing of
             tellurium-containing materials

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 1, 1962, 22, abstract 10164
             ("Metallurg; i khim. prom-st' Kazakhstana. Nauchno-tekhn. sb.",
             1961, no. 1(11), 23-25)

TEXT: The authors studied the possibility of applying the sulfide-sulfite
method to the processing of rich Te-containing products. It is shown that this
method ensures the extraction of 93 - 94% of the Te from the primary hydroxide
(at an Na_2S expenditure of 5 - 6 kg per 1 kg Te) as against 60 - 70% extraction
by the soda method, and when soda slags are processed - 81-84% versus 40-50%.
The reagent expenditure and process duration are reduced when the sulfide-sulfite
method is used.

                                                    G. Svodtseva

[Abstracter's note: Complete translation]

Card 1/1

ZEMSKOV, S.V.; PTITSYN, B.V. [deceased]

Oxidation of cis- and trans-isomers of bivalent platinum by sodium vanadate. Zhur. neorg. khim. 10 no.6:1502-1503 Je '65.
(MIRA 18:6)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR.

ZEMSKOV, S.V.; PTITSYN, B.V.

Oxidation of the platinite series by sodium vanadate. Dokl. AN SSSR
160 no.2:343-345 Ja '65.
(MIRA 18:2)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR.
2. Chlen-korrespondent AN SSSR (for Ptitsyn).

SAKHAROVA, N.M.; ZEMSKOV, S.V.

Double chlorides of cerium group elements and trimethylamine
chloride. Dokl. AN SSSR 120 no. 3:539-540 My '58.   (MIRA 11:7)

1. Saratovskiy gosudarstvennyy universitet im. N.G.Chernyshevskogo.
Predstavleno akademikom I.I.Chernyayevym.
                         (Rare earth chlorides)
                            (Trimethylamine)

S/137/62/000/001/032/237
A060/A101

AUTHORS: Koz'min, Yu. A., Ryabinin, A. I., Zemskov, S. V.

TITLE: On the oxidation of tellurium up to the tetravalent state

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 1, 1962, 22, abstract 1G163
             ("Metallurg. i khim. prom-st' Kazakhstana. Nauchn.-tekhn. sb.",
             1961, no. 2(12), 57-61)

TEXT: A study was made as to the possibility of obtaining water-soluble
Te from anodic copper electrolytic slimes by producing a definite composition of
the gaseous phase and the charge preparation schedule. It was established that
in the course of oxidizing roasting of the slime with soda the Te is transformed
almost entirely into the hexa-valent variety, and in the course of the aqueous
lixiviation of the clinker if remains in the cake. Calcination of the clinker
in a stream of CO_2 or N_2 at $700 - 750^{\circ}C$ affords the possibility of transforming
70% and more of the Te into the tetra-valent, soluble variety. The reduction of
Te to Te^{++++} by carbon monoxide occurs at lower temperatures. In the laboratory
investigations the transformation of Te into Te^{++++} constituted 80 - 90%.

                                                          G. Svodtseva

[Abstracter's note: Complete translation]

Card 1/1

NIVOSELOV, R.I.; ZEMSKOV, S.V.; PTITSYN, B.V.

Oxidation of tetrammine platinum chloride by iodine. Dokl. AN SSSR 158
no.5:1133-1135 O '64.   (MIRA 17:10)

1. Institut neorganicheskoy khimi Sibirskogo otdeleniya AN SSSR. 2.
Chlen-korrespondent AN SSSR (for Ptitsyn).

CHERNYAYEV, I.I.; ZEMSKOV, S.V.; PTITSYN, B.V. [deceased]

Oxidation-reduction properties of nitrite complexes of platinum.
Zhur.neorg.khim. 10 no.11:2404-2410 N '65.

(MIRA 18:12)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR.
Submitted May 5, 1964.

ZEMSKOV, V.A. (Leningrad); MAKAR'YEV, B.M. (Leningrad)

Improvement of the characteristics of automatic control systems of a certain class using nonlinear control signs. Izv. AN SSSR. Tekh. kib. no.6:60-71 N-D '63.   (MIRA 17:4)

ZEMSKOV, V.A. (Leningrad); MAKAR'YEV, B.M. (Leningrad)

Improvement of the interference rejection of a class of automatic control systems by means of nonlinear control laws. Izv. AN SSSR. Tekh. kib. no.1:143-149 Ja-F '65.

(MIRA 18:4)

GONCHAREVICH, Igor' Fomich; ZENKOV, Vasiliy Dmitriyevich; KORESHKOV,
Viktor Ivanovich; BRILLIANTOV, V.V., otv.red.; GARBOR, P.N.,
red.izd-va; BOLDYREVA, Z.A., tekhn.red.

[Shaker screens and conveyers] Vibratsionnye grokhoty i
konveiery. Moskva, Gos.nauchno-tekhn.izd-vo lit-ry po gornomu
delu, 1960.   214 p.   (MIRA 14:3)
      (Screens (Mining))   (Conveying machinery)

ZEMSKOV, V. D.

ANDREYEV,S.Ye.; BOKIY,B.V.; GORODETSKIY,P.I.; OREYVER,N.S.; SHCHUKIN,A.A.
GERONT'YEV,V.I.; SKOCHINSKIY,A.A.; TERPIGOREV,A.M.; SHEVYAKOV,L.D.;
SPIVAKOVSKIY,A.A.; VERKHOVSKIY,I.M.; VORONKOV,I.M.; YELANCHIK,G.M.;
KASHIN,N.V.; SLOBODKIN,M.I.; GUZENKOV,P.G.; ZEMSKOV,V.D.; NOVIKOV,F.S.
OSETSKIY,V.M.; SOSUNOV,G.I.; YASYUKEVICH,S.M.; KHAN,G.A.; POPOV,V.M.

In memory of Professor Levenson. Gor.zhur. no.9:60 S '55.
                                              (MIRA 8:8)
    (Levenson, Lev Borisovich, 1878-1955)

ZEMSKOV, V.D.; KOVAL', P.V.

Calculating the impact mechanism in dynamic coal plows.
Nauch. trudy MGI no.21:201-214 '57.   (MIRA 11:9)
            (Coal mining machinery)

ZEMSKOV, V.D., kandidat tekhnicheskikh nauk; BRILLIANTOV, V.V., kandidat
tekhnicheskikh nauk; VINOGRADOV, N.N., kandidat tekhnicheskikh nauk.

A misconception constantly appearing in books on ore dressing.
Ugol' 32 no.4:47-48 Ap '57.   (MLRA 10:5)

1. Moskovskiy gornyy institut.
                  (Ore dressing)

ZEMSKOV V. D.

127-58-1-15/28

AUTHORS: Verkhovskiy, I.M., Professor, Doctor of Technical Sciences;
Zemskov, V.D., and Vinogradov, N.N., Candidates of Technic-
al Sciences; Arutinov, O.M., Engineer-Physicist

TITLE: Investigation by the Gamma-Location Method of Some Re-
gularities in the Jigging Process (Issledovaniye nekotorykh
zakonomernostey protsessa otsadki metodom gamma-lokatsii)

PERIODICAL: Gornyy Zhurnal, 1958, Nr 1, pp 53-56 (USSR)

ABSTRACT: Numerous versions of the "marked atoms" method employed at
present do not make possible the study of the kinetics of
the spatial motion of grains in media with different ab-
sorption coefficients. Therefore, the Chair of Concentra-
tion at the Moscow Mining Institute developed a new method,
named "gamma-location", for the continuous study of mineral
grain motion. The gamma-location method makes it possible
to record continuously the spatial displacements of a part-
icle under investigation into which a radioactive isotope
with hard gamma-radiation is inserted. The block-diagram
of the equipment is shown in Figure 1. The equipment con-
sists of the following basic parts: 1) an indicator

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127-58-1-15/28

Investigation by the Gamma-Location Method of Some Regularities in the
Jigging Process

system; 2) an electronic computer; 3) an oscillograph;
4) a high-voltage stabilized amplifier, and 5) a stabi-
lizer of voltage. The essence of the gamma-location method
consists in that the spatial motion of the grains is broken-
down into 3 coordinates, by means of special systems of in-
dicators. The motion of the grain along each coordinate is
continuously recorded as a function of time. The indicator
systems consist of standard discharge counters situated
according to a definite system, called "carpets". The
electronic computer converts the pulses into direct current
proportional to their frequency. It consists of several
similar channels corresponding to the number of coordinates
being measured simultaneously. The results permit the dis-
covery of basic laws of grain motion in jigging machines.
For instance, the graph of the motion of a heavy grain re-
presents a monotonous function (shown in Figure 2) which
indicates that the grain continuously sinks to the bottom
layer. The motion of light grains has a "jump-like" cha-
racter shown in Figure 3. Analysis of the results shows

Card 2/3   that the state of intermediate, slightly loosened layers

127-58-1-15/28

Investigation by the Gamma-Location Method of Some Regularities in the
Jigging Process

(thickness and degree of loosening) is a criterion of the
jigging process which determines the specific weight of
separation and the quality of concentration products. The
intermediate layers serve as a filter which passes down
only grains of a definite specific gravity. The filtering
properties of the intermediate layer depend upon many fac-
tors: specific gravity and size of the grains, the magni-
tude of hydrodynamic forces, and mechanical interaction
forces between the grains. The establishment of the effects
of these factors calls for extensive investigations.
The article contains 1 figure, 2 graphs, and 7 references,
of which 5 are Soviet and 2 English.

ASSOCIATION: Moskovskiy gornyy institut (Moscow Mining Institute)

AVAILABLE: Library of Congress

Card 3/3   1. Tracers-Applications   2. Isotopes (Radioactive)-Applications
              3. Gamma rays-Applications   4. Mining engineering-USSR

ZEMSKOV, V.D., dots.

Basic problems in the theory of unbalanced shaker screen per-
formance. Nauch. dokl. vys. shkoly; gor. delo no.2:281-296 '58.
(MIRA 11:6)

1. Predstavlena kafedroy obogashcheniya poleznykh iskopayemykh
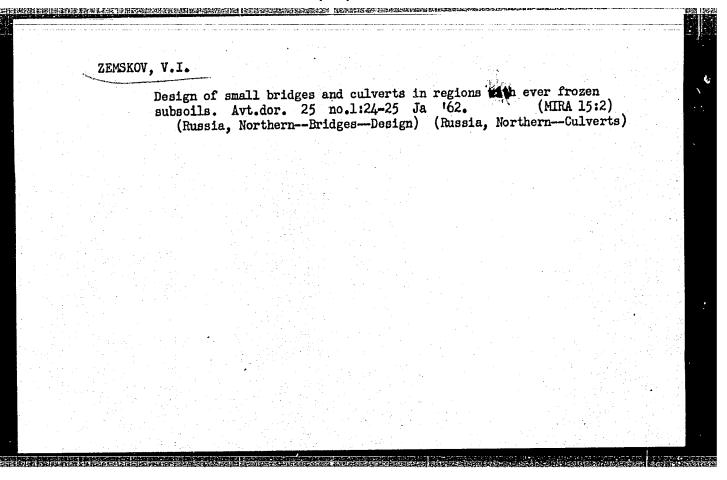Moskovskogo gornogo instituta im. I.V. Stalina.
(Screens (Mining))

ZEMSKOV, V.D., dots., kand.tekhn.nauk

Analysis of transition processes in vibrating screens. Nauch.dokl.
vys.shkoly; gor.delo. no.4:231-240 ' 58.   (MIRA 12:1)

1. Predstavleno kafedroy obogashcheniya poleznykh iskopayemykh Moskov-
skogo gornogo instituta imeni I.V. Stalina.
                    (Screens (Mining))

ZEMSKOV, V.D.· BRILLIANTOV, V.V.; VINOGRADOV, N.N.; SHOKHIN, V.N.
    VLAD, P.

Electric measurement methods in investigating wet gravity ore
dressing processes. Nauch. trudy MGI no. 32:5-14 '60.

                                            (MIRA 14:2)

   (Ore dressing)   (Electric measurements)

ZHGULEV, Al'bert Sergeyevich; ZEMSKOV, V.D., kand. tekhn. nauk,
      retsenzent; BRILLIANTOV, V.V., kand. tekhn. nauk, otv.
      red.; GARBER, T.N., red.izd-va; LAVRENT'YEVA, L.G.,
      tekhn. red.

[Electrovibrating machine operator] Mashinist elektrovib-
ratsionnoi mashiny. Moskva, Gosgortekhizdat, 1963. 91 p.
                                            (MIRA 16:12)
    (Ore dressing--Equipment and supplies) (Vibrators)

ZEMSKOV, V.I.

Design of small bridges and culverts in regions with ever frozen
subsoils. Avt.dor. 25 no.1:24-25 Ja '62.   (MIRA 15:2)
    (Russia, Northern--Bridges--Design) (Russia, Northern--Culverts)

ZEMSKOV, V.M., prof.

C-reactive protein in the diagnosis of some cardiovascular diseases
(coronary insufficiency, rheumatism).   Vrach. delo no.6:22-26 Je '61.
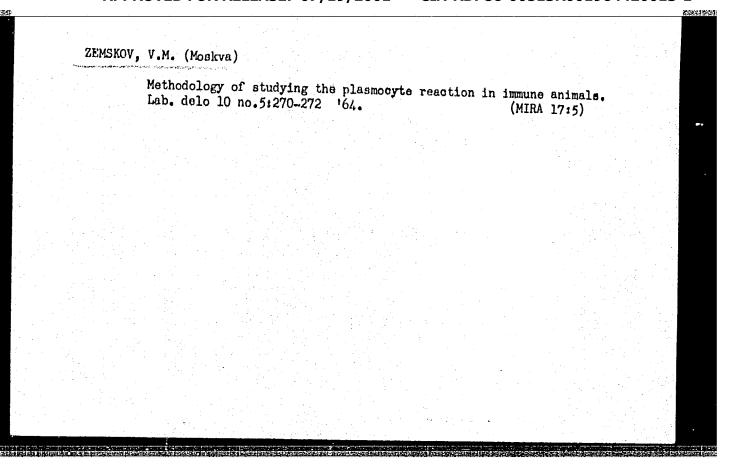(MIRA 15:1)

1. Kafedra fakul'tetskoy terapii (zaveduyushchiy – M.N.Tumanovskiy)
i kafedra mikrobiologii (zaveduyushchiy – prof. M.V.Zemskov)
Voronezhskogo meditsinskogo instituta.
        (BLOOD PROTEINS)   (HEART FAILURE)
              (RHEUMATIC FEVER)

ZEMSKOV, V.M.

Dynamics of C-reactive protein, erythrocyte sedimentation reaction, and leucocytes in myocardial infarct. Lab. delo 7 no.3:20-22 Mr '61.   (MIRA 14:3)

1. Kafedra fakul'tetskoy terapii (zav. - prof. M.N.Tumanovskiy) i Kafedra mikrobiologii (zav. - prof. M.V.Zemskov) Voronezhskogo meditsinskogo instituta.
        (BLOOD PROTEINS)   (ERYTHROCYTES)
        (LEUCOCYTES)   (HEART—INFARCTION)

ZEMSKOV, V.M. (Moskva)

Methodology of studying the plasmocyte reaction in immune animals.
Lab. delo 10 no.5:270-272 '64.   (MIRA 17:5)

PETROV, R.V.; ZEMSKOV, V.M.; PASHININ, P.M.

Place of the formation of S-reactive protein in radiation
injury. Radiobiologiia 5 no.4:511-513 '65.   (MIRA 18:9)

ZEMSKOV, Vladimir Mikhaylovich; SOROKO, Ya.I., red.

[Weapons of invisible enemies] Oruzhie nevidimykh vragov.
Moskva, Izd-vo "Znanie," 1964. 39 p. (Novoe v zhizni,
nauke, tekhnike. VIII Seriia: Biologiia i meditsina, no.11)
                                        (MIRA 17:7)

ZEMSKOV, V.M.

Morphological indices of immunity; a review.   Zhur. mikrobiol.,
epid. i imm. 41 no. 2:25-28 F '64.   (MIRA 17:9)

137-58-6-12122

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 6, p 134 (USSR)

AUTHORS: Petrov, D.A., Kekua, M.G., Dashevskiy, M.Ya., Zemskov, V.S., Petrusevich, R.L.

TITLE: Progress of Work on the Refining of Germanium by Means of Crystallization and Achievement of Germanium Single Crystals With Longitudinally Homogeneous Properties (Razvitiye rabot po ochistke germaniya metodami kristallizatsii i polucheniye monokristallov germaniya s ravnomernymi svoystvami po dline)

PERIODICAL: V sb.: Vopr. metallurgii i fiz. poluprovodnikov. Moscow, AN SSSR, 1957, pp 50-58

ABSTRACT: Experiments were performed in order to investigate the possibilities of producing single crystals with uniform longitudinal and cross-sectional distribution of impurities by means of pulling at a controlled rate as well as by pulling accompanied by constant feeding of pure Ge into the melt. The raw polycrystalline material with a ρ of 5-20 ohm/cm was purified by means of zonal recrystallization under a vacuum of 10^{-4} mm Hg, or in a stream of H_2, until it exhibited a ρ of 50-60 ohm/cm. A high-frequency heating apparatus with three

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137-58-6-12122

Progress of Work on the Refining of Germanium (cont.)

induction units moving back and forth was employed. It was found that single Ge crystals, grown by the Chokhralskiy method from purified material with a ρ of 50-60 ohm/cm in conjunction with mixing of the melt by rotating the crucible and the growing crystal, can achieve ρ and τ values of 60 ohm/cm and 1000 μ sec, respectively; if the rotation is omitted from the growth process, the ρ and the τ amount to 25-50 ohm/cm and 200-250 μ sec, respectively. The UVM-2 apparatus, employed in the process of pulling the crystal under vacuum (10^{-4} mm Hg) in accordance with scheduled variations of the rate of pulling, utilizes a hydraulic raising mechanism which provides a smooth variation of the elevation rate from 0.05 to 8 mm/min in conjunction with the rotation of the crucible and the growing crystal. The ρ value of grown crystals 50 mm in diameter and 180 mm long deviated from the mean value of $\sim$ 40-60 ohm/cm, at a length of 100-150 mm, by 8.9-9.3% and was within the limits of error of measurement. It is pointed out that because of variations in conditions of crystallization only macrouniformity in the distribution of impurities can be achieved by this method. The variations were eliminated in another device which was designed for a process in which the pulling is accompanied by feeding of pure Ge into the melt. Prior to immersion into the melt, the feed ingot passes through a heating unit (composed of a quartz tube wound with W wire), while the ingot being pulled passes
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137-58-6-12122

Progress of Work on the Refining of Germanium (cont.)

through a water-cooled unit made of stainless steel. The process of pulling
was carried out in an Ar atmosphere. The fact that the feed ingot and the
growing crystal, which may rotate, were placed excentrically with respect
to the axis of rotation of the crucible, contributed to a better mixing of the
melt contained in the crucible. It was found that the longitudinal ρ fluctua-
tions in single crystals obtained by this method did not exceed $\pm 5\%$,
whereas in the case of a crystal produced in this apparatus without the em-
ployment of pure Ge the scatter amounted to $\pm 24\%$. Studies of crystals
with a diameter of 50 mm have revealed that the ρ was sufficiently uniform
throughout the cross section of the crystal and that the diffusion-path length
of minority current carriers did not deviate by more than 10-15%. The
authors express the opinion that intensive cooling of the growing crystal,
which results in the achievement of a plane crystallization front, contributes
to uniform distribution of electrical properties throughout the cross section
of the crystal. Grown single crystals which exhibited nonuniform cross-
sectional distribution of ρ were subjected to heat treatment in order to bring
about a redistribution of ρ values; in the process the mean value of resistiv-
ity remained unaltered, while the diffusion-path length of the minority cur-
rent carriers increased somewhat. 1. Germanium--Processing   2. Germanium--Crystalli-
zation   3. Single crystals--Growth   4. Single crystals--Properties   I.S.
Card 3/3

ZEMSKOV, V.S.

137-58-5-9454

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 5, p 92 (USSR)

AUTHORS: Petrov, D.A., Zemskov, V.S.

TITLE: Equipment and Methods of Growing Single Crystals of Semi-
conductors (Apparatura i metody vyrashchivaniya mono-
kristallov poluprovodnikov)

PERIODICAL: V sb.: Rost kristallov. Moscow, AN SSSR, 1957, pp 262-
272

ABSTRACT: An examination is made of the equipment and the results ob-
tained in growing single crystals of Ge by the Chokhral'skiy
method and by drawing with feeding of additional substance.
Drawing was performed by means of an apparatus consisting of
3 parts. At the bottom there was mounted a vacuum circulation
chamber, connected with a system for evacuation. Water-cooled
electrodes, to which were mounted a graphite slit heater and
screens, were introduced into the chamber. Into the chamber
from beneath there was introduced a motor-rotated rod carrying
a crucible base. A quartz beaker with a viewing tap was placed
atop the circulation chamber on rubber gaskets. The beaker was
closed at the top by a water-cooled cover, to which was mounted

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137-58-5-9454

Equipment and Methods of Growing Single Crystals of Semiconductors

a mechanism for raising and rotating the seed-crystal-carrying finger passing through the cover into the chamber. The apparatus provided a vacuum of $\sim 10^{-4}$ mm Hg. The cover and lower chamber were connected by bolts for operation in a gas atmosphere. It is noted that in order for a single crystal to be grown the temperature of the melt should increase from its center toward the bottom and the walls of the crucible; some degree of overheating of the melt tends to increase the reliability of single crystal formation. To produce a single crystal, the seed crystal has to be fused along the entire interface between seed crystal and melt. Rotation of the crucible and the growing crystal is conducive to symmetrical growth of the crystal, but when the rate of crystal rotation is ~ 350 rpm, formation of a screw-shaped crystal is observed. There is a brief examination of the distribution of impurities in the drawing process. Changes in the apparatus to permit feeding of additional substance are described. The crystal being fed is passed through the heater, while the crystal being drawn passes through a cooler. This apparatus made it possible to obtain uniform longitudinal distribution of In^{114} along the single crystal drawn when a melt of pure Ge was fed in. This was verified by autoradiograph photometry and by resistance measurement (resistance variations of $\pm 5\%$). The importance of good mixing of the melt on drawing with feeding of additional substance is noted. 1. Single crystals--Growth 2. Germanium crystals--Growth   Yu.Sh.
Card 2/2 3. Indium isotopes (Radioactive)--Applications 4. Autoradiography--Applications
     5. Semiconductors--Crystal structure

ZEMSKOV, V. S.

CHERKASHIN, Yevgeniy Yevgeniyevich; GLADYSHEVSKIY, Ya.I., dotsent, otv.
    red.; ZEMSKOV, V.S., red.; SARANYUK, T.V., tekhred.

[Metric analysis of chemical equilibrium diagrams of systems
containing associated components] Metrika ravnovesnoi khimi-
cheskoi diagrammy sistem s assotsiirovannymi komponentami.
Izd-vo L'vovskogo univ., 1958. 106 p.   (MIRA 11:12)
                    (Systems (Chemistry))

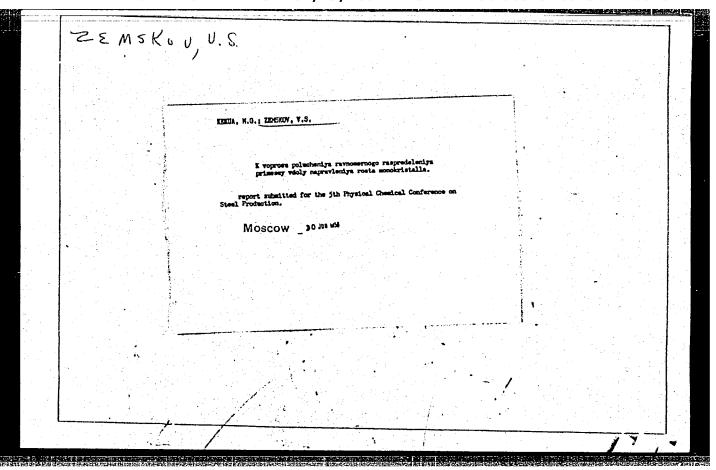LENEVICH, Lev Grigor'yevich, prof.; ZEMSKOV, V.S., red.; MALYAVKO, A.V., tekhred.

[Multiview method in descriptive geometry] Bezosnyi metod v nachertatel'noi geometrii. Izd-vo L'vovskogo univ., 1958. 155 p.

(Geometry, Descriptive)   (MIRA 12:4)

ZEMSKOV, U.S.

KEKUA, M.O.; ZEMSKOV, V.S.

K voprosu polucheniya ravnomernogo raspredeleniya
primesey vdoly napravleniya rosta monokristalla.

report submitted for the 5th Physical Chemical Conference on
Steel Production.

Moscow _ 30 Jan 58

24.7700

67293
SOV/180-59-4-26/48

AUTHORS: Zhurkin, B.G., Zemskov, V.S., Petrov, D.A. and
             Suchkova, A.D.   (Moscow)

TITLE: The Nature of the Quasi-Binary Germanium-Indium-Antimony
             System

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh
            nauk, Metallurgiya i toplivo, 1959, Nr 4, pp 156-158 (USSR)

ABSTRACT: Germanium with electron-type conduction and a specific
            resistance 25 to 30 ohm/cm was used together with zone
            refined antimony and indium. Crystals were pulled from
            the melt. Results are given in Table 1. All the samples
            had electron-type conductivity and samples with high InSb
            content had a higher concentration of electrons than those
            with low InSb content. The number of current carriers
            varied from 1.2×10^{18} to $1.9 \times 10^{19}/cm^3$. The value for
            fully compensated additions is $2.5 \times 10^{13}/cm^3$. Thus there
            was an excess of Sb atoms. Experiments were carried out
            using the same Ge:Sb ratio and increasing the In content.
            Results are given in Table 2. With a ratio of In:Sb of
            2.5 there is still electronic conduction very near to the
            compensated alloy. With In:Sb = 4.4 there is hole-type

Card 1/2   conduction. Microstructures were examined along the

The Nature of the Quasi-Binary Germanium-Indium-Antimony System

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length of the crystal pulled from a melt. A second
phase appears (see Fig) which from microhardness tests
corresponds to InSb. It does not appear, however, at
temperatures greater than $650^\circ C$ - the temperature of
dissociation of InSb. The authors conclude that because
of dissociation of InSb in fused germanium, the system does
not possess the properties of a quasi-binary system.
There are 1 figure, 2 tables and 8 references, 6 of which
are Soviet and 2 English.

SUBMITTED: March 16, 1959

Card 2/2

67801

SOV/180-59-5-13/37

24.7700
24.7600

AUTHORS: Zhurkin, B.G., Zemskov, V.S., Petrov, D.A., and Suchkova, A.D. (Moscow)

TITLE: The Solubility of Indium and Antimony in Germanium and their Effect on some Electrical Properties of Germanium

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, Metallurgiya i toplivo, 1959, Nr 5, pp 86-90 (USSR)

ABSTRACT: Single crystals of germanium were pulled from melts doped with up to 80 wt % of indium or of antimony. [111] seeds were used; growth rate was 0.04 mm/min and the crystal was rotated at 140 rpm. Starting materials were: high purity germanium (25-30 ohm.cm N-type, mobility 3600 cm^2/V.sec, diffusion length ～ 1.5-2 mm); indium showing spectrographic traces of Fe, Al, Cu, Ca, Ni and antimony of Cu, As, Pb, Au, Al and P. A pure graphite crucible fitted with a quartz sheathed thermocouple (Fig 1) held a charge of 10-12 g. The pulled ingots were 7-9 mm diameter and 8-10 mm long. These were cut in half lengthways. One half was studied metallographically for homogeneity while Hall effect specimens (7 x 3 x 1 mm) were cut from the other, close to the seed and perpendicular to the growth axis. Resistivity and Hall

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67801

SOV/180-59-5-13/37

The Solubility of Indium and Antimony in Germanium and their
Effect on some Electrical Properties of Germanium

emf were measured with a potentiometer type PPTN-1 and a
galvanometer type M-25/3. Resistivity measurements
were ± 5% but Hall measurements (3700 Oe field) for the
higher impurity concentrations had greater errors, from
10-50%. In determining impurity concentrations from
resistivity and Hall measurements complete ionization
and degeneracy were assumed. The table shows
equilibrium concentrations of indium and antimony in
solid and liquid germanium at various temperatures (both
wt % and at % values are given). The corresponding
phase diagrams are plotted in Figs 3 and 4 (compositions
in at %). Solid Ge containing $6.6.10^{-2}$ at % In is in
equilibrium with a melt containing 71.6 at % In at
620 °C, and solid germanium containing $7.2 . 10^{-2}$ at %
Sb with liquid containing 70.5 at % Sb at 693 °C.
Extrapolation to the eutectic horizontals suggests
maximum solid solubilities of $8 . 10^{-2}$ at % In and about
0.1 at % Sb. No retrograde solid solubility was found
for Sb. Fig 5 shows log-log plots (which are linear)

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SOV/180-59-5-13/37
The Solubility of Indium and Antimony in Germanium and their
Effect on some Electrical Properties of Germanium

of resistivity vs impurity concentration for Sb (1) and In (2) doping. 2.5×10^{-19} Sb/cm^3 gave $\sim 6 . 10^{-4}$ ohm.cm, and $2 . 10^{-19}$ In/cm^3 gave $2 . 10^{-3}$ ohm.cm. Fig 6 shows the corresponding variations in Hall mobility; the plots for both holes and electrons varying similarly. The results presented for In are in good agreement with those in Ref 3.

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There are 6 figures, 1 table and 14 references, of which 3 are Soviet, 10 English and 1 German.

SUBMITTED: April 3, 1959

S/180/61/000/006/018/020
E073/E535

AUTHORS: Zemskov, V.S., Suchkova, A.D. and Wang Kuei-Hua
             (Moscow)

TITLE: On the nature of heterogeneous equilibrium in the
             system germanium-aluminium-antimony

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Otdeleniye.
             tekhnicheskikh nauk. Metallurgiya i toplivo.
             no.6, 1961, 149-151

TEXT: In earlier work of the authors and their team
(Ref.1: Izv.AN SSSR, OTN, Metallurgiya i toplivo, 1959, No.4)
it was established that the Ge-InSb in the ternary Ge-In-Sb
does not represent the real equilibrium between the solid and
liquid phases during crystallization and, consequently, does not
have all the properties of a binary system. Therefore, the
necessity arose to verify the results obtained with the Ge-In-Sb
system on other systems and the Ge-Al-Sb system was chosen for
this purpose.   The AlSb compounds are thermally more stable
than InSb compounds and, therefore, it was to be anticipated that
the behaviour of aluminium and antimony during crystallization of
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On the nature of heterogeneous ...   S/180/61/000/006/018/020
                                      E073/E535

germanium will differ from the behaviour of In and Sb. For
investigating this system, the method of drawing the primary
crystals of the solid solution from the appropriate melts
containing various quantities of the alloying components was
chosen. Measures were taken for creating equilibrium conditions
of crystallization and for obtaining single-crystal specimens.
The specimens were drawn at a rate of 0.045 mm/min; the seed was
rotated at a speed of 100 to 120 r.p.m, and the crucible remained
stationary.   The germanium used had a specific resistance of
14 Ohm·cm and a diffusion length of 2.5 mm and an aluminium
impurity content not exceeding 10^{-4} %; the antimony was grade
CY -000 (SU-000). On the drawn crystals of the solid solutions
the Hall constant and the specific resistance were measured.
Two sections of the system containing 98 and 97 at.% Ge with
various ratios of Al and Sb contents were investigated. The
compositions of the initial melts of germanium from which primary
crystals were produced are those given in Table 1.   On the
basis of the measured values of the Hall constant, the specific
resistance of the solid solution crystals, of the determination

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                                     E073/E535

of the type of conductivity and of the calculated values of the
concentrations of the current carriers, graphs were plotted of
the changes in the electric parameters of the solid solutions as
a function of the concentrations of Al and Sb in the conjugate
liquid phases. It can be seen that crystals drawn from melts
with an equi-atomic ratio of Al and Sb contents (curves a_1 and
b_1) have a clearly pronounced hole-type conductivity. A change
in the ratio of these elements until the Sb atoms predominate
above the Al atoms by a factor of 20 does not lead to a change in
the type of conductivity. If the ratio equals 22 to 25, the
crystals will have a mixed-type conductivity and only if the
content of Sb is over 25 times that of the Al content will there
be a change to electron conductivity. An increase in the
content of Sb in the liquid phase as compared to the content of
Al leads to a change in the ratio of these elements in the solid
phase towards full compensation, thereby reducing the number of
current carriers, and the specific resistance will begin to
increase. After compensation, the type of conductivity changes
into electron conductivity and the specific resistance will again

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On the nature of heterogeneous ...   S/180/61/000/006/018/020
E073/E535

drop as a result of an increase in the quantity of Sb atoms
above that of the Al atoms. In the system Ge-Al-Sb the observed
changes in the electric characteristics are similar to those
occurring in the system Ge-In-Sb; the section Ge-AlSb in the
system Ge-Al-Sb is also not quasi-binary. If the ratio of the
Sb atoms to the In atoms in the melt is 22 to 25, i.e. approach-
ing the ratio of the coefficients of distribution of Al and Sb
in binary systems with germanium (for Sb the coefficient of
distribution at the given temperature is 2.9×10^{-3} and for
Al it is 7×10^{-2}), the solid phase crystallizes with an equi-
atomic ratio of Al and Sb atoms. The observed behaviour can be
explained by dissociation of antimonides in the melting.
Acknowledgments are expressed to B. G. Zhurkin for his assistance.
There are 2 tables, 1 figure and 3 Soviet-bloc references.

SUBMITTED: May 18, 1961

Card 4/4

24.7700 (1035, 1043, 1055)

AUTHORS: Zhurkin, B. G., Zemskov, V. S., and Yurkina, K. V.

TITLE: Hall mobility of electrons in highly alloyed n-type germanium

PERIODICAL: Fizika tverdogo tela, v. 3, no. 11, 1961, 3509 - 3513

TEXT: The Hall mobility of electrons in n-type germanium monocrystals alloyed with antimony (up to $2.5 \cdot 10^{19}$ cm^{-3}) and arsenic (up to $6.0 \cdot 10^{19}$ cm^{-3}) was studied. Specimens cut from monocrystal ingots were used for measurements carried out at room temperature. The specimens had the dimensions $7 \cdot 3 \cdot 1$ mm, the ingots had been produced by crystal pulling. The method of manufacturing strongly alloyed germanium was described in previous papers (B. G. Zhurkin et al., Izv. AN SSSR, OTN, no. 5, p. 86, 1959; V. S. Zemskov et al., Tezisy dokl. na konf. po udarnoy ionizatsii i tunnel'nomu effektu v poluprovodnikakh, Baku, 14 - 17, 1960). Electron-electron collisions were not taken into account because of degeneration in alloyed germanium. The Hall mobility was computed by the relation

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Hall mobility of electrons in highly...

$\mu = R/\rho$, where R is the Hall constant and ρ the resistivity. The two latter quantities were measured with the use of a ПППН-1 (PPTN-1) voltmeter and an M25/3 (M25/3) galvanometer by a d-c compensation method. Magnetic fields of 3800-4200 oe were employed to measure R. The measuring error of ρ was ± 5 %, that of the Hall-emf $\pm (10-20)$%. The results showed that the Hall mobility of the electrons in germanium alloyed with antimony $(10^{18} - 10^{19}$ cm$^{-3})$ by far exceeds that of germanium of equal arsenic concentration. At an impurity concentration of about 10^{19} cm^{-3} the Hall mobility of electrons in germanium alloyed with antimony is almost twice that in germanium alloyed with arsenic. It is assumed that this difference is due to a change in effective electron mass m_n with the impurity. When electron scattering from impurity atoms and lattice vibrations was taken into account, an estimation of the effective masses $m_{n(Sb)}$ and $m_{n(As)}$ showed that within the concentration range of $5 \cdot 10^{17} - 2.5 \cdot 10^{19}$ cm^{-3} $m_{n(Sb)}$ was changed from 0.19 m to 0.30 m. In the range of arsenic concentration

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Hall mobility of electrons in highly...

30793
S/181/61/003/011/038/056
B104/B102

of $5 \cdot 10^{17} - 5 \cdot 10^{19}$ cm^{-3}, $m_{n(As)}$ was changed from 0.195 m to 0.52 m. The authors thank B. M. Vul', L. V. Keldysh, and V. A. Chuyenkov for discussions. There are 1 figure, 2 tables, and 10 references: 3 Soviet and 7 non-Soviet. The three most recent references to English-language publications read as follows: W. Waring, D. Pitman, S. Steele, J. Appl. Phys., 29, no. 6, 1002, 1958; W. E. Baker, D. M. Compton. J. B. M. J. Res. and Develop., 4, no. 3, 275, 1960; M. Cardona, W. Paul, H. Brooks. Helv. phys. acta, 33, no. 5, p. 329, 1960.

ASSOCIATION: Institut metallurgii im. A. A. Baykova AN SSSR Moskva
(Institute of Metallurgy imeni A. A. Baykov AS USSR, Moscow)

SUBMITTED: March 3, 1961 (initially) July 3, 1961 (after revision)

Card 3/3

ZEMSKOV, V., polkovnik; BULATOV, A., polkovnik

Precarious period of a war and vigilance. Voen. vest. 41 no.9:31-33
S '61.   (MIRA 15:1)
    (European War, 1914-1918) (World War, 1939-1945)
            (United States--Militarism)

S/058/63/000/002/045/070
A062/A101

AUTHOR: Zemskov, V. S., Zhurkin, B. G., Suchkova, A. D., Yurkina, K. V.

TITLE: Production and properties of strongly alloyed germanium

PERIODICAL: Referativnyy zhurnal, Fizika, no. 2, 1963, 71, abstract 2E473
             ("Tr. Soveshchaniya po udarn. ionizatsii i tunnel'n. effektu v
             poluprovodnikakh, 1960". Baku, AN AzerbSSR, 1962, 130 - 150)

TEXT: By the method of extracting the solid phase from a smelt with a large
content of alloying admixture, single crystals of Ge were obtained with a concen-
tration of Al up to $1.0 \cdot 10^{21}$ cm^{-3}, with a concentration of As up to $6.0 \cdot 10^{19}$ cm^{-3},
with a concentration of Sb up to $2.5 \cdot 10^{19}$ cm^{-3} and with a concentration in In up
to $2.0 \cdot 10^{19}$ cm^{-3}. It is established that there is an increase of solubility of In
and Sb in Ge at a combined alloying, and this is explained on the basis of the
electron-hole interaction in the solid phase. Applying the method of quantitative
radiography and measuring the Hall effect made it possible to determine separately
the concentration of In and Sb in the solid phase of Ge, while the data on the
Hall mobility show an absence of neutral ion pairs $[\text{In}^- \text{Sb}^+]^0$. It was found that

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A062/A101

at room temperature the Hall mobility in Ge with Sb, in the range of Sb concentrations from $2 \cdot 10^{18}$ to $5 \cdot 10^{19}$, is about twice as high as the Hall mobility in Ge with As at equal concentrations of the admixtures.

[Abstracter's note: Complete translation]

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37735

S/180/62/000/002/014/018
E039/E435

/D. P/0 0

AUTHORS: Zemskov, V.S., Suchkova, A.D., Zhurkin, B.G.,
             Wang Kuei-Hua (Moscow)

TITLE: The solubility of aluminium in germanium and the
             influence of aluminium on some electrical properties of
             germanium

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Otdeleniye tekhnicheskikh
             nauk. Metallurgiya i toplivo. no.2, 1962, 131-134

TEXT: The initial materials used were electron type germanium
with a specific resistance of 50 ohm cm and aluminium purified by
zone melting containing Fe $< 7 \times 10^{-4}$%, Mg 2×10^{-4}%,
Si 4×10^{-4}%, Cu 5×10^{-5}% and Zn $< 1 \times 10^{-4}$%.   Alloys were
prepared by the extraction method and all the investigated samples
were single phase.   The region of solid solution was investigated
at 675°C.   It is shown that the concentration of Al in solid
solution varied from 9.97×10^{-3} at.% at a concentration of
Al of 0.1 at.%, to 1.544 at.% at 46.2 at.% Al.   A solidus curve
is plotted on which is included results from earlier papers.
Good agreement is obtained at 850°C but the earlier results
Card 1/2

The solubility of aluminium ...

S/180/62/000/002/014/018
E039/E435

give rather lower values of Al concentration at temperatures less than 850°C. The concentration of current carriers was determined by measuring the Hall constant in a magnetic field of 4000 oersted and using the formula $n = A/Re$ where A is a coefficient, dependent on the diffusion mechanism of the current carriers, R is the Hall constant and e is the electronic charge. There are no accurate data for the change in A with concentration of acceptor atoms. However, estimated values are shown to give results within the limits of experimental error. The dependence of the specific resistance ρ on the concentration of Al atoms n is also determined and shown to fall on the same line as values for In and for In, Al, Ga obtained previously. ρ varies from 5×10^{-2} to 2×10^{-4} ohm cm for n varying from 10^{17} to 10^{21} cm^{-3}. Values of the Hall mobility are calculated and shown to agree with earlier results. A weak dependence of μ on the concentration of acceptors is found at a concentration of Al atoms $\geqslant 10^{18}$ cm^{-3} which appears to be dependent on screening. There are 3 figures and 1 table.

SUBMITTED: May 31, 1961
Card 2/2

37736

S/180/62/000/002/015/018
E040/E535

/8./200

AUTHORS: Zemskov, V.S., Zhurkin, B.G. and Yurkina, K.V. (Moscow)

TITLE: The solubility of arsenic in germanium

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Otdeleniye
            tekhnicheskikh nauk. Metallurgiya i toplivo, no.2,
            1962, 134-135

TEXT: Arsenic is one of the most commonly used alloying
elements of germanium but, in spite of this, the available
technical data for the solubility of arsenic in germanium are
incomplete and often conflicting. The present investigation was
carried out using a technique involving the extraction of samples
from molten germanium solution containing various concentrations
of arsenic and subsequent investigation, of the specimens thus
obtained, by X-ray structural and microscopic analyses, determina-
tion of the quantity of current carriers from measurements of the
Hall constant and measurement of the specimen resistivity at
room temperature. The starting materials for the investigations
were germanium with the resistivity ρ = 35-40 ohm·cm and diffusion
length of the minority current carriers of not less than 2-2.5 mm.
Card 1/2

The solubility of arsenic ...   S/180/62/000/002/015/018
                                       E040/E535

The arsenic contained calcium and magnesium impurities in
concentrations not exceeding 10^{-3} and $10^{-4}\%$, respectively. A
partial phase composition diagram for the As-Ge system is
constructed in semi-logarithmic coordinates in the temperature
range 700 - 937°C and the solidus line is drawn in, together with
the liquidus line quoted on the basis of data reported by
H. Stöhr and W. Klemm (Ref.6: Z.anorgan.und allgem.Chem., 1940,
244, p.205). It was established that the highest solubility of
arsenic in germanium does not exceed 0.12 at.%. The above figure
for the maximum solubility of arsenic in germanium-base solid
solution agrees well with the value recently reported in the
paper by P. L. Moody and A. J. Strauss (Ref.9: J. Electrochem.Soc.,
1960, v.107, p.64).   There are 1 figure and 1 table.

SUBMITTED: May 31, 1961

Card 2/2

S/076/62/036/009/003/011
B101/B102

AUTHORS: Zemskov, V. S., Suchkova, A. D., and Zhurkin, B. G. (Moscow)

TITLE: Study of the heterogeneous equilibrium in the system Ge-In-Sb

PERIODICAL: Zhurnal fizicheskoy khimii, v. 36, no. 9, 1962, 1914 - 1918

TEXT: The equilibrium between the solid and liquid phases was determined on three cross sections passing through the Ge-InSb cross section. The a - a cross section corresponded to a Ge content of 86.7 atom%, equilibrium temperature 860°C, the b - b cross section to a Ge content of 71 atom%, equilibrium temperature 812°C, and the c - c cross section to a Ge content of 41.2 atom%, equilibrium temperature 672°C. The concentration of admixtures (In, Sb) was determined in the Ge crystal pulled at 0.4 mm/min. n-type Ge was used, resistivity 30 ohm.cm, electron mobility 3600 cm/v.sec, diffusion length of minority carriers >2 mm. The crystals were examined radiographically, the number of carriers and the Hall constant were determined, and the macro- and microstructures were investigated. The Sb concentration was determined with the aid of Sb^{124}, the In concentration on the basis of the number of current carriers. Results:

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Study of the heterogeneous ...

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B101/B102

(Fig.): Solid phases containing more Sb than In are in equilibrium with the Ge-InSb cross section. Thus, the Ge - InSb cross section is not a quasibinary system as it does not reproduce the true equilibrium between the solid and liquid phases. The increased solubility of In and Sb jointly present in Ge is explained by an electron - hole equilibrium in the solid phase, since the formation of $[In^- Sb^+]^0$ complexes is improbable at the experimental temperature. There is 1 figure.

ASSOCIATION: Institut metallurgii im. A. A. Baykova (Institute of Metall-
               urgy imeni A. A. Baykov)

SUBMITTED: January 7, 1961

Fig. Variation of the Sb and In contents in the solid phases as a func-
tion of their concentrations in the liquid phase. (a) = a - a cross
section; (b) = b - b cross section; (c) = c - c cross section; (1) Sb in
the solid phase; (2) In in the solid phase; $at.\%$ = atom%; dotted line
= theoretical solubility.

Card 2/0

L 17996-63   EWP(q)/EWT(m)/BDS   AFFTC/ASD/ESD-3   RM/JD
ACCESSION NR: AP3001278   S/0181/63/005/006/1601/1604

AUTHORS: Zemskov, V. S.; Belaya, A. D.

TITLE: Interaction of aluminum and antimony during crystallization of germanium
from melts containing these elements

SOURCE: Fizika tverdogo tela, v. 5, no. 6, 1963, 1601-1604

TOPIC TAGS: solid solution, Ge, Al, Sb, distribution coefficient

ABSTRACT: The authors have investigated the heterogeneous equilibrium in the
three-member system Ge-Al-Sb. They studied solid solutions obtained from melts
containing 97, 90, and 80 atomic % Ge with different Al-Sb ratios. They found
qualitative support for earlier conclusions that a layer of Ge-AlSb does not
reflect equilibrium between liquid and solid phases during crystallization of
germanium melts according to the composition lying in this layer. The distribution
coefficients of the elements show an interaction between atoms of the alloying
components during changes in the ratios of these alloying elements in a melt.

Card 2/2

ACCESSION NR: AP4040989   S/0279/64/000/003/0154/0157

AUTHORS: Zemskov, V. S. (Moscow); Rozhdestvenskaya, V. V. (Moscow)

TITLE: Boron distribution during crystallization of solid solutions of germanium in silicon

SOURCE: AN SSSR. Izvestiya. Metallurgiya i gornoye delo, no. 3, 1964, 154-157

TOPIC TAGS: boron germanium, silicon, solid solution, semiconductor, doping, impurity content

ABSTRACT: The behavior of most doping components during crystallization of Ge and Si furnishes data on equilibrium coefficients of distribution depending on the concentration of the doping impurity in the melt. When the boron content is small in a melt ($3 \cdot 10^{18}$ cm^{-3}), its effective coefficient of distribution is found to be 17 during crystallization of Ge, 0.8 during crystallization of Si. But there have been no studies on the interaction between doping impurities and Ge and Si during crystallization of solid solutions of these semiconductors to give a continuous series of solid solutions. The authors now furnish results of studies on the distribution of boron during crystallization of Ge-Si solutions containing boron.

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ACCESSION NR: AP4040989

Their experiments show that when the Ge content in melts is increased to 30%, the effective coefficient of boron distribution increases from less than one to values near one and higher. This coefficient depends on the concentration of boron in the solid phase, and when the concentration changes from $6.2 \cdot 10^{18}$ to $4.4 \cdot 10^{20}$ atm/cm^3, it is almost halved, which indicates a change in ionization conditions of boron atoms in the solid phase. "The authors thank N. Kh. Abrikosov for his constant interest in the work and V. P. Dmitriyev for his aid in measuring the electrical conductivity." Orig. art. has: 1 figure, 1 table, and 6 formulas.

ASSOCIATION: none

SUBMITTED: 09Sep63   ENCL: 00

SUB CODE: EC   NO REF SOV: 004   OTHER: 007

Card 2/2

ACCESSION NR: AP4043399   S/0181/64/006/008/2552/2554

AUTHORS: Zemskov, V. S.; Belaya, A. D.; Podkory*tova, G. N.

TITLE: On the electric activity of tin in germanium

SOURCE: Fizika tverdogo tela, v. 6, no. 8, 1964, 2552-2554

TOPIC TAGS: tin, germanium, doping, liquid phase, solid phase,
distribution statistics, single crystal, Hall effect, electroneutral
molecule, impurity conduction, ionization energy

ABSTRACT: In view of the contradictory data on this subject, the
authors attempt to ascertain the electric activity of tin in ger-
manium by employing a theory of H. Reiss (J. Chem. Phys., v. 21,
1209, 1953), from which it follows that when the ionization condi-
tions of the doping atoms change, an accompanying change takes
place in the distribution coefficients of these elements between
the liquid and solid phase. Thus, if tin is a donor, then its addi-

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ACCESSION NR: AP4043399

tion to germanium doped with an acceptor element should cause an
increase in the distribution coefficient of both the tin and of
the acceptor element. The acceptor element employed was gallium.
The germanium single crystals were grown by a procedure described
in detail elsewhere (FTT, v. 5, 1601 and 1100, 1963). The gallium
concentration was determined by Hall-effect measurements. The ob-
tained data on the concentration of gallium and tin in the solid
phase were used to calculate the distribution coefficients and to
plot the dependence of the distribution coefficients of gallium
and tin on the ratio of these elements in the liquid phase. The
results can be interpreted only by assuming that tin is not elec-
trically neutral and that its donor nature is due to the unusual
dependence of the distribution coefficient of gallium on its con-
centration in the melt. This explains also the disparity between
the theoretically calculated and experimentally measured distribu-
tion coefficients of gallium, for the calculations were based on
the assumption that the tin is electrically neutral. It is there-

Card   2/4

ACCESSION NR: AP4043399

fore concluded that tin serves as a donor impurity in germanium and that the ionization energy of the tin atoms is close to the ionization energy of the germanium. Orig. art. has: 1 figure.

ASSOCIATION: Institut metallurgii im. A. A. Baykova, Moscow (Institute of Metallurgy)

SUBMITTED: 02Mar64   ENCL: 01

SUB CODE: SS   NR REF SOV: 004   OTHER: 006

Card 3/4

ZEMSKOV, V.S.; SUCHKOVA, A.D.; ZHURKIN, B.G.

Heterogeneous equilibrium in the system Ge - In - Sb. Zhur. fiz. khim. 36 no.9:1914-1918 S '62.   (MIRA 17:6)

1. Institut metallurgii imeni A.A. Boykova, Moskva.

GLAZOV, V.M.; ZEMSKOV, V.S.; ZHIRKIN, B.G.; SUCHKOVA, A.D.; LYU CHZHEN'-YUAN'
[Liu Chen-yüan]

Physicochemical analysis of systems Ge(Si) $- A^{II} - B^{V}$. Trudy
Inst. met. no.14:108-119 '63   (MIRA 17:8)

ZEMSKOV, V.S. (Moskva); ROZHDESTVENSKAYA, V.V. (Moskva)

Distribution of boron during the crystallization of solid
solutions of germanium in silicon. Izv. AN SSSR Met. i gor. delo
no.3:154-158 My-Je'61.   (MIRA 17:7)

ZEMSKOV, V.S.; BELAYA, A.D.; PODKORYTOVA, G.N.

Electric activity of tin in germanium. Fiz. tver. tela 6 no.8: 2552-2554 Ag '64.   (MIRA 17:11)

1. Institut metallurgii imeni Baykova, Moskva.

ZEMSKOV, V.S.

Phosphorus vapor pressure over a silicon melt alloyed with phosphorus.
Izv. AN SSSR. Neorg. mat. 1 no.5:648-654 My '65.   (MIRA 18:10)

1. Institut metallurgii imeni Baykova.